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JUL 19 2005
PATENT & TRADEMARK OFFICE
JC8

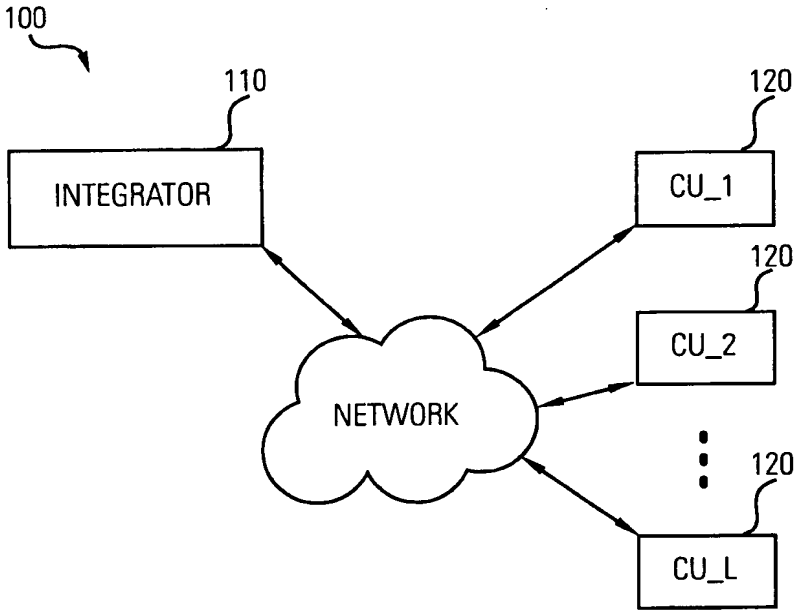

FIG. 1

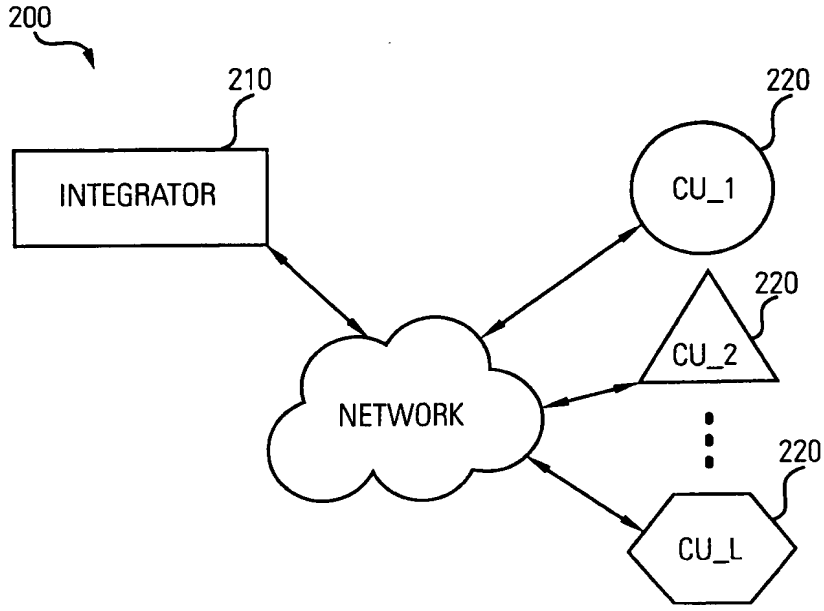

FIG. 2

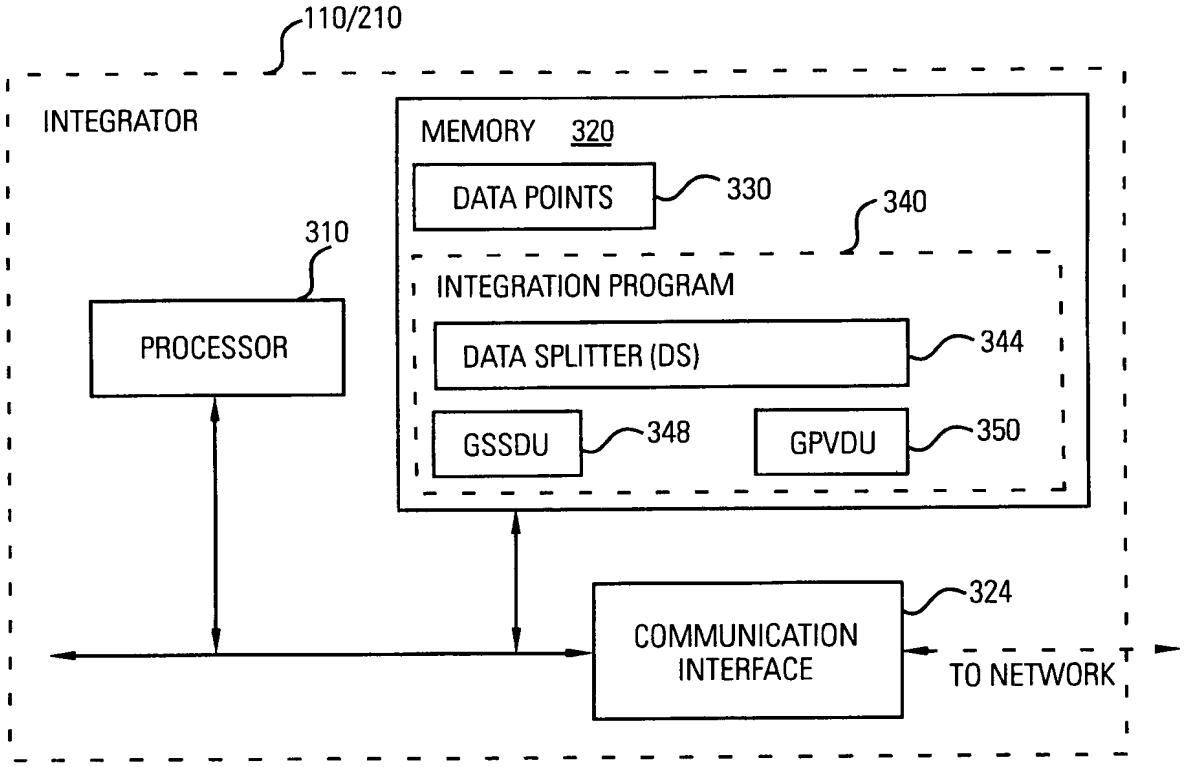
110/210
INTEGRATOR
MEMORY 320
DATA POINTS
330
340
310
INTEGRATION PROGRAM
PROCESSOR
DATA SPLITTER (DS)
344
GSSDU
348
GPVDU
350
324
COMMUNICATION INTERFACE
TO NETWORK

FIG. 3

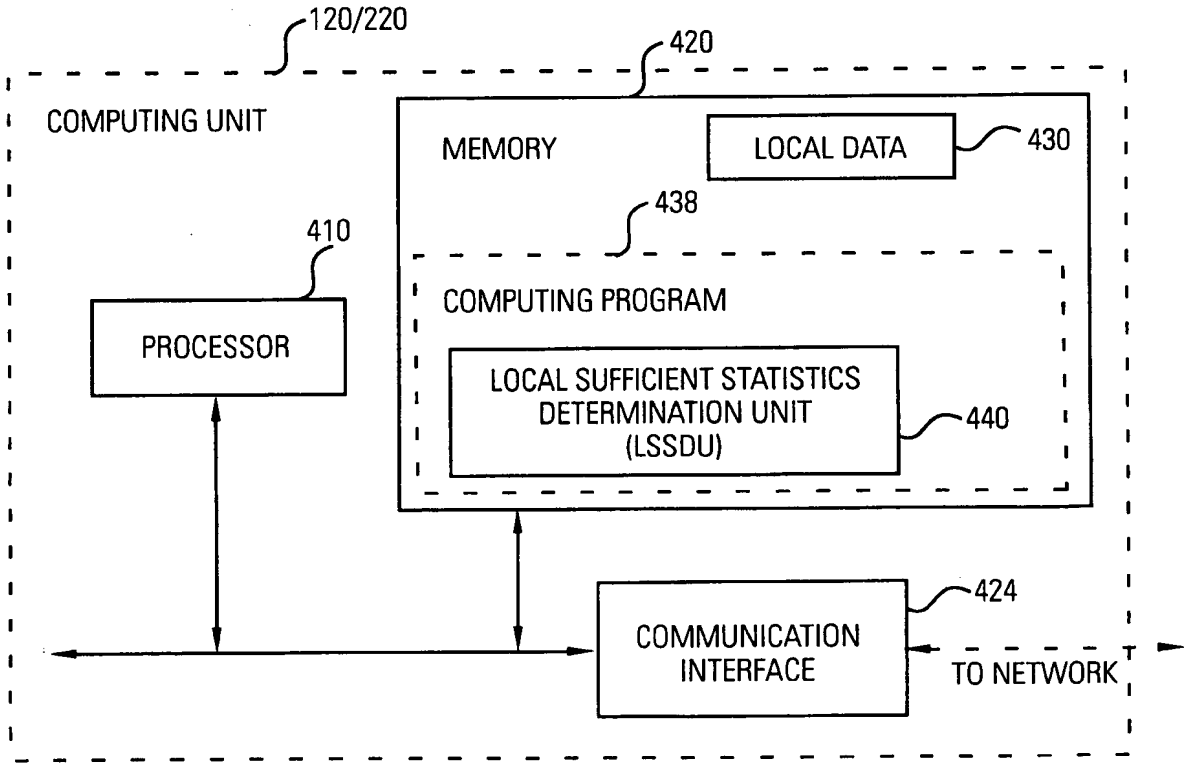
120/220
420
COMPUTING UNIT
MEMORY
LOCAL DATA
430
438
410
COMPUTING PROGRAM
PROCESSOR
LOCAL SUFFICIENT STATISTICS DETERMINATION UNIT (LSSDU)
440
424
COMMUNICATION INTERFACE
TO NETWORK

FIG. 4

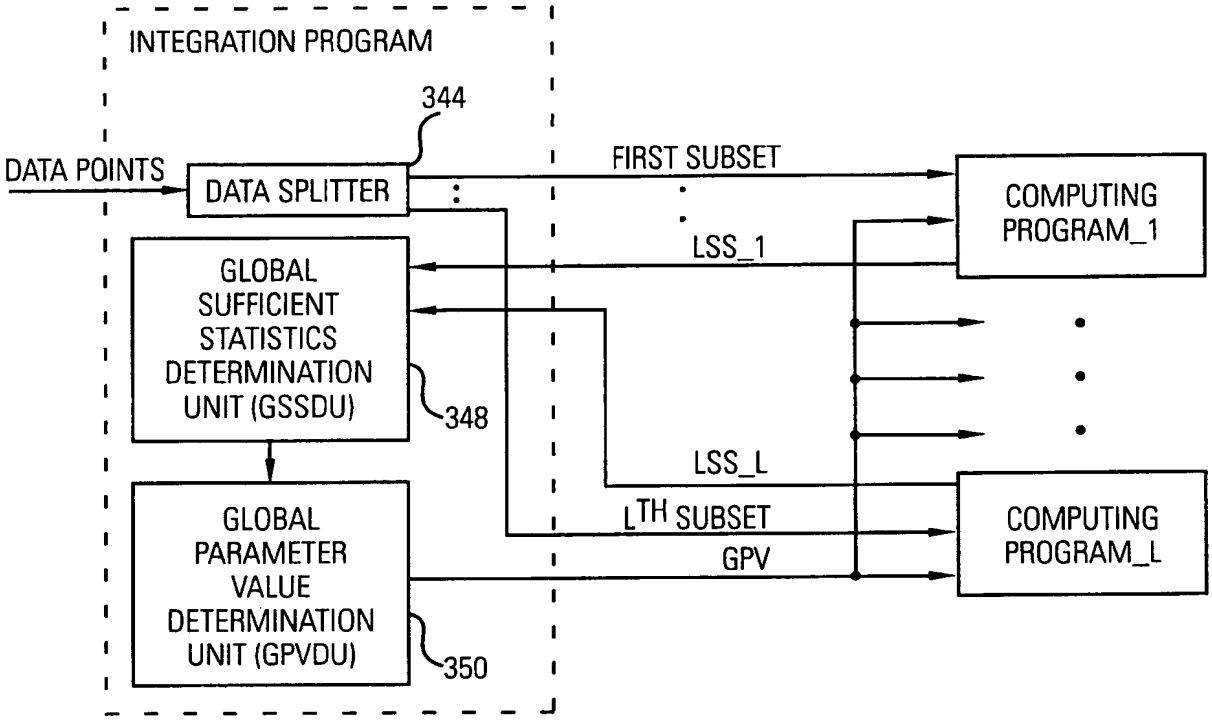
INTEGRATION PROGRAM
344
DATA POINTS
DATA SPLITTER
FIRST SUBSET
COMPUTING PROGRAM_1
LSS_1
GLOBAL SUFFICIENT STATISTICS DETERMINATION UNIT (GSSDU)
348
LSS_L
L^TH SUBSET
COMPUTING PROGRAM_L
GPV
GLOBAL PARAMETER VALUE DETERMINATION UNIT (GPVDU)
350

FIG. 5

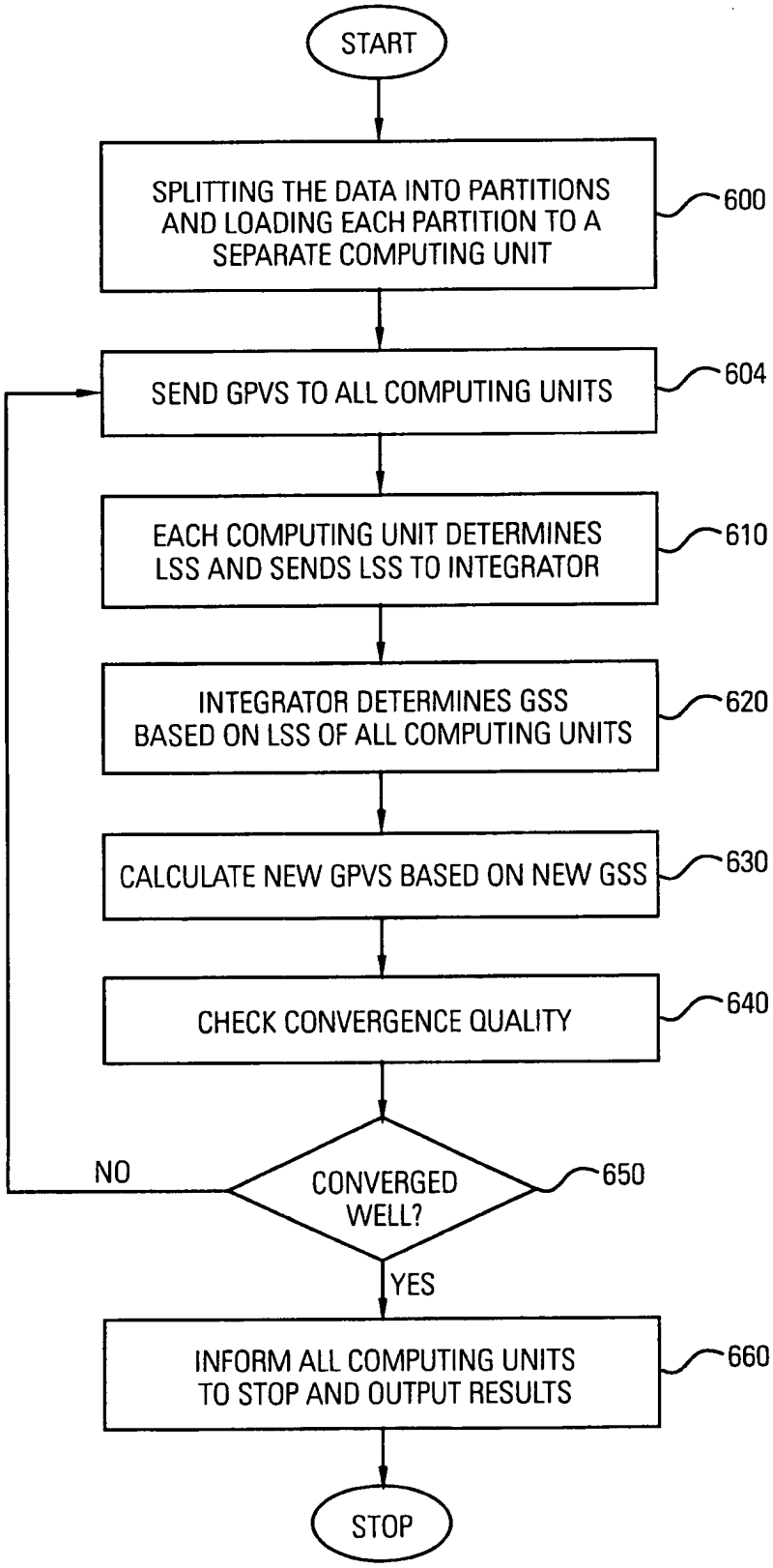
START
SPLITTING THE DATA INTO PARTITIONS AND LOADING EACH PARTITION TO A SEPARATE COMPUTING UNIT
600
SEND GPVS TO ALL COMPUTING UNITS
604
EACH COMPUTING UNIT DETERMINES LSS AND SENDS LSS TO INTEGRATOR
610
INTEGRATOR DETERMINES GSS BASED ON LSS OF ALL COMPUTING UNITS
620
CALCULATE NEW GPVS BASED ON NEW GSS
630
CHECK CONVERGENCE QUALITY
640
CONVERGED WELL?
650
NO
YES
INFORM ALL COMPUTING UNITS TO STOP AND OUTPUT RESULTS
660
STOP

FIG. 6

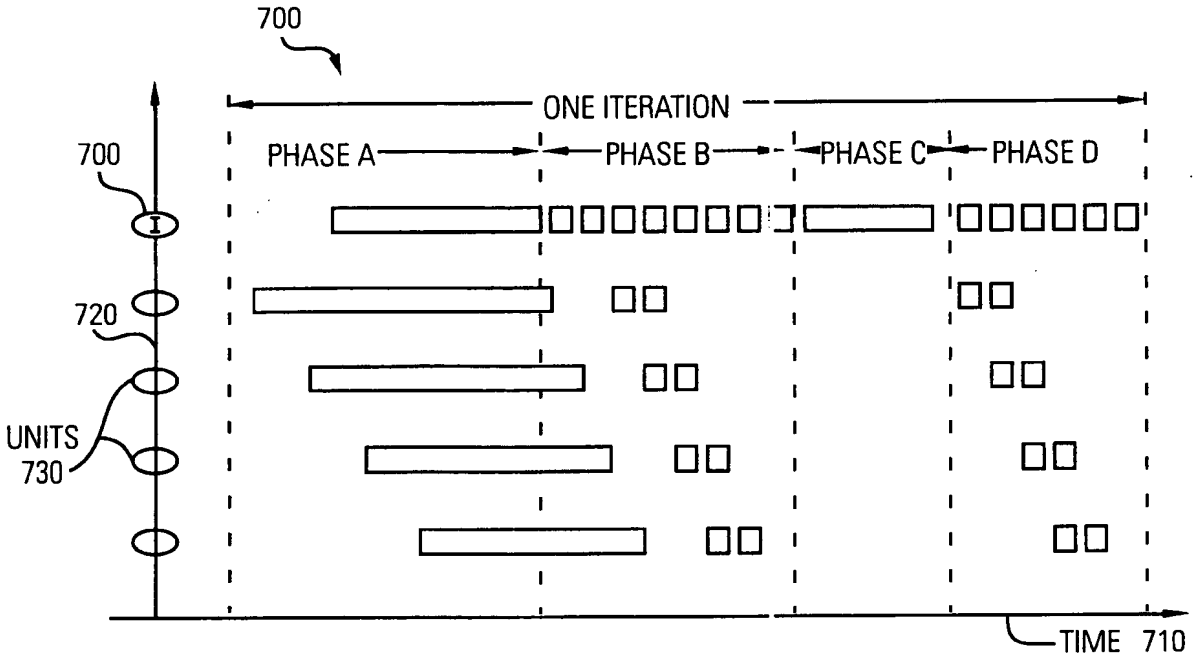
700
ONE ITERATION
700
PHASE A
PHASE B
PHASE C
PHASE D
720
UNITS
730
TIME 710

FIG. 7

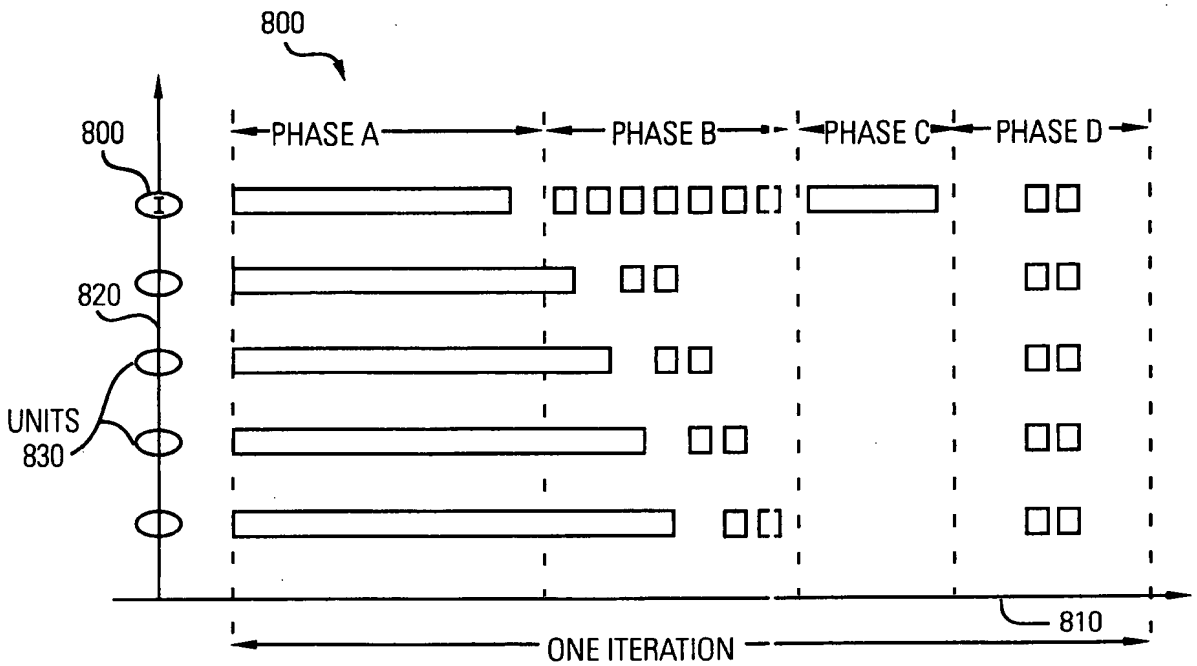
800
800
PHASE A
PHASE B
PHASE C
PHASE D
820
UNITS
830
810
ONE ITERATION

FIG. 8

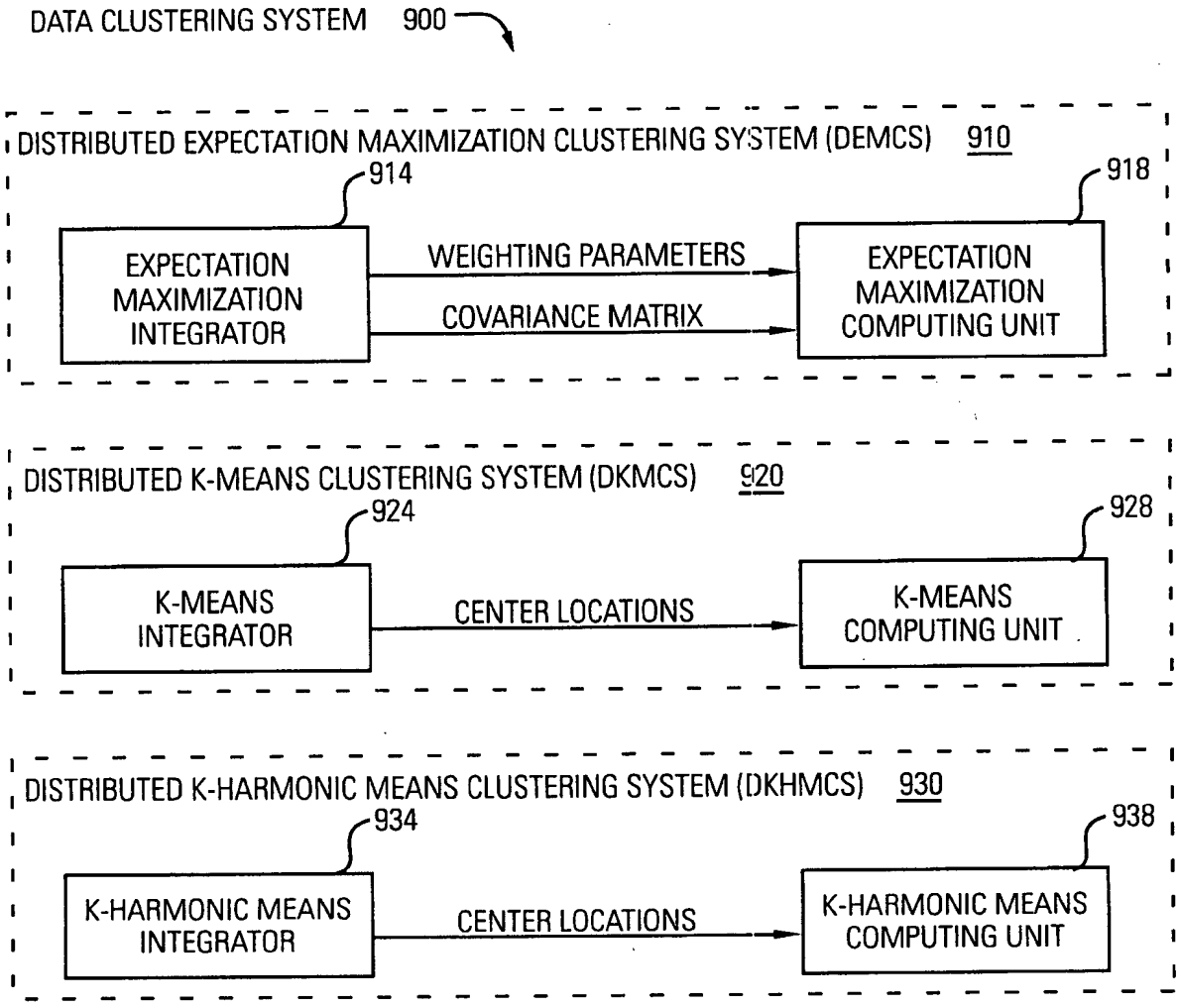
DATA CLUSTERING SYSTEM 900
DISTRIBUTED EXPECTATION MAXIMIZATION CLUSTERING SYSTEM (DEMCS) 910
914
EXPECTATION MAXIMIZATION INTEGRATOR
WEIGHTING PARAMETERS
COVARIANCE MATRIX
918
EXPECTATION MAXIMIZATION COMPUTING UNIT
DISTRIBUTED K-MEANS CLUSTERING SYSTEM (DKMCS) 920
924
K-MEANS INTEGRATOR
CENTER LOCATIONS
928
K-MEANS COMPUTING UNIT
DISTRIBUTED K-HARMONIC MEANS CLUSTERING SYSTEM (DKHMCS) 930
934
K-HARMONIC MEANS INTEGRATOR
CENTER LOCATIONS
938
K-HARMONIC MEANS COMPUTING UNIT

FIG. 9